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(72) Inventors JOHN TRACEY SCALES and DAVID GODDARD



(54) PROSTHETIC FEMORAL DEVICES

(71) We, NATIONAL RESEARCH DEVELOPMENT CORPORATION, a British Corporation established by Statute, of Kingsgate House, 66-74 Victoria Street, London, S.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

5 10 This invention concerns prosthetic femoral devices and more particularly such devices as employed in partial and total hip joint replacement.

15 These more particular devices usually comprise a ball-form head to co-operate with the natural acetabular cavity in a partial replacement and with a prosthetic acetabular cup in a total replacement, the head being integrally connected to a fixation part securable to the femur.

20 25 According to the present invention there is provided a prosthetic femoral device for partial or total hip joint replacement, which device comprises a fixation part terminating in a tapered spigot, and a ball-form head having a complementarily tapered socket for separable frictional engagement with said spigot.

30 35 The fixation part of currently available prosthetic femoral devices usually comprises an elongate, generally rectilinear, tapered stem having an angled extension, termed a trochanter section, at its wider end, which section terminates in the ball-form head. The present invention can employ such a fixation part, in which case the trochanter section terminates in said spigot.

40 45 The invention is particularly advantageous for partial replacement situations. Partial replacement is appropriate when the acetabular cartilage is in good condition. However, in the long term cartilage degenerates when in contact with a non-cartilaginous surface such as presented by the head of the femoral device. This leads to a need for "conversion" from a partial to a total replacement. This, in turn, normally involves replacement of the original femoral com-

ponent by another with a head of smaller diameter and such replacement is necessarily difficult if the original device was securely fixed with cement. 50

The proposed device is equally advantageous in any other situation giving rise to a requirement for a change in femoral component head size. There is also advantage in affording a reduction in the number of parts which need to be made and stocked in association with a range of stems and trochanter sections having different features, on the one hand, and an appropriate range of head sizes, on the other hand. 55

For a clearer understanding of the present invention, an example of the same is diagrammatically illustrated by the accompanying drawing. 60

In the drawing the stem of the device is denoted at 1 with the trochanter section at 2 as an integrally formed, angled extension therefrom. The outer end of the section 2 is formed as a tapered spigot 3. 65

The associated head is denoted at 4 as a hollow, part-spherical component having an integrally formed sleeve 5 depending diametrically therein towards the mouth of the hollow. The sleeve interior is tapered in complementary manner to the spigot 3 so that the head can be received on the spigot as shown. Given suitable accuracy of manufacture of the spigot and sleeve interior, a sharp tap on the head will serve to lock the same in position for practical purposes. 70

75 Any subsequent need for removal of the head is met by use of a suitable extractor tool. In this connection, engagement between the head and the tool is facilitated by the provision of a threaded bore 6 in the apex of the head and co-axial with the socket. This bore will be closed normally by a threaded plug 7 of plastics material such as polyethylene, say, to obviate ingrowth of tissue while being readily removable for the purposes of head replacement. 80

85 90 95 The bore 6 can also be usefully employed to assist in mounting the head during its manufacture and polishing.

WHAT WE CLAIM IS:—

1. A prosthetic femoral device for partial or total hip joint replacement, comprising a fixation part terminating in a tapered spigot, and a ball-form head having a tapered socket therein of complementary form to that of said spigot for separable frictional engagement therebetween.
2. A device according to Claim 1 where-
10 in said fixation part comprises an elongate, generally rectilinear, tapered stem having an angled extension therefrom at its wider end, which extension terminates in said spigot.
3. A device according to Claim 1 or 2
15 wherein said head is a hollow, part-spherical

component having an integrally formed sleeve depending diametrically therein towards the mouth of the hollow, and said socket is provided by the interior of said sleeve.

4. A device according to Claim 1, 2 or 3 wherein said head has a threaded bore formed in the exterior thereof substantially co-axially with said socket, and a plug in said bore. 20

5. A prosthetic device substantially as 25 herein described with reference to the drawings.

G. R. PARKER,
Chartered Patent Agent,
Agent for the Applicants.

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